Blade Nano CP X "Mild"

Brushless Upgrade

Written By: Daryoon

TOOLS:

- CA adhesive (1)
- Phillips screwdriver (1)
- Sandpaper (1)
- Solder (1)
  The thinner it is, the easier it is to work with. I like .8mm solder.
- Soldering iron (1)
- Tweezers (1)
- X-Acto knife (1)

PARTS:
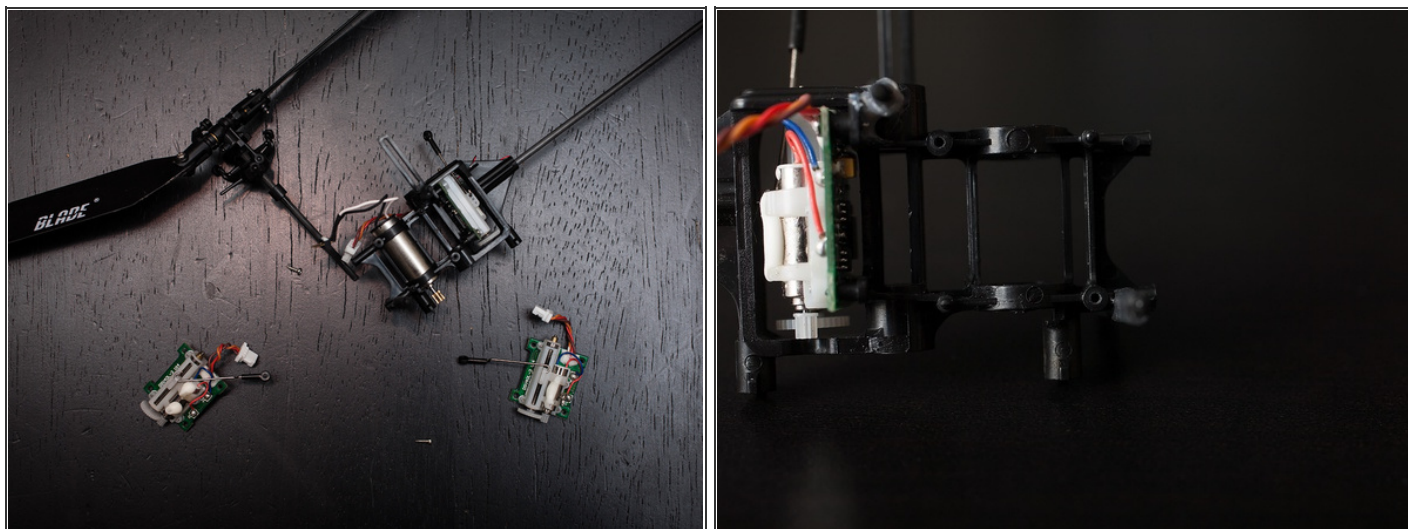
- Nano CP X Mild brushless kit (1)
- short length of 24 or 26 gauge wire (1)

SUMMARY

The Blade Nano CP X is a great small R/C helicopter. However, its brushed main motor can die prematurely. Let's fix that with an aftermarket kit by Astroid Designs.

This guide will provide step-by-step instructions on how to replace the stock brushed motor with a more efficient and powerful brushless motor that utilizes BLHeli code to govern the headspeed.
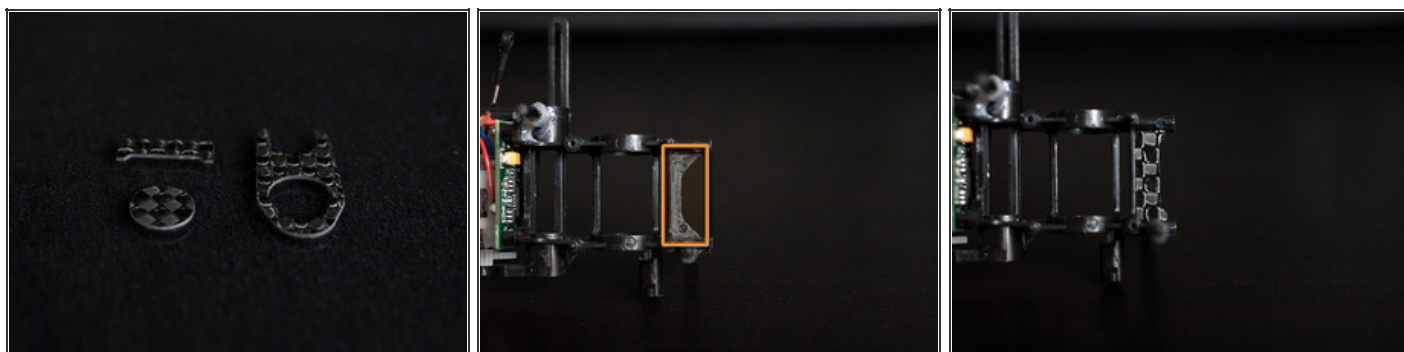
Step 1 — Prepare Nano CP X for upgrading

- Remove the 3in1 main board and landing gear.

- Remove main shaft assembly.

  - *Scrape rubbery adhesive that helps fix the main gear to the shaft. The entire main shaft assembly will lift up once you slide off the main gear and disconnect the servo links from the swashplate.*

- Remove both side servos.

- Remove tail boom.

- Finally, remove the stock brushed motor from the frame by pushing up from the bottom. The motor will slide out once the black rubbery glue gives.

- *Optional: You can remove the bearings from the frame to prevent accidentally getting CA on them. Likewise, you can remove the remaining pitch servo.*
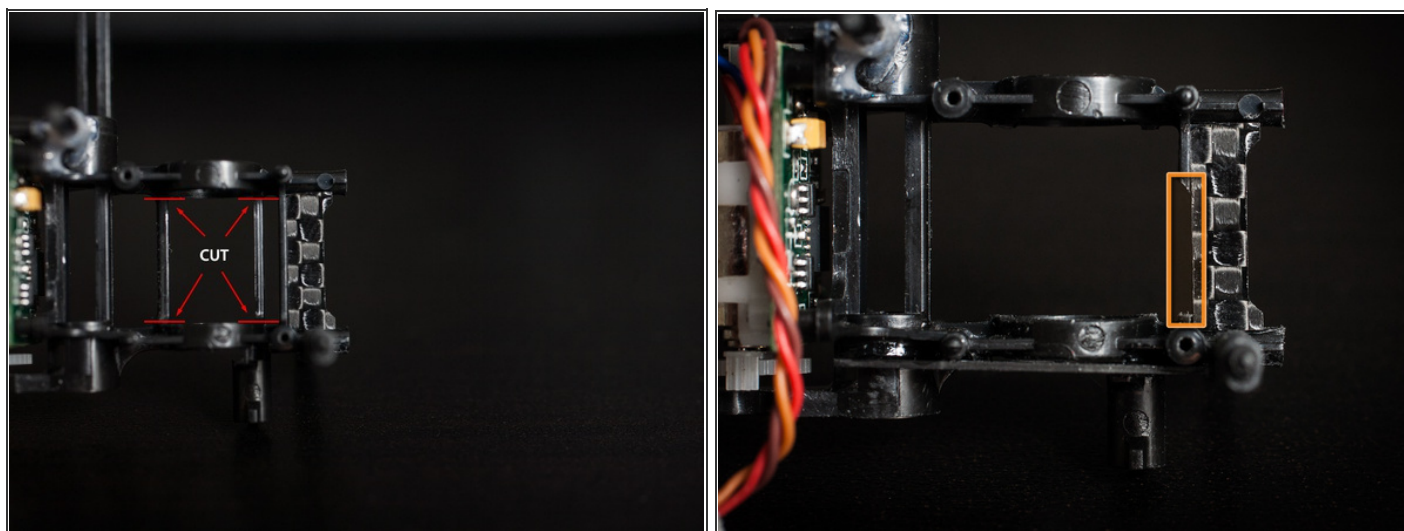
Step 2 — Install Frame Braces

- Use sandpaper to lightly roughen each of the included CF braces and the areas of main frame they will be attached to. This step ensures proper glue adhesion.
- Use a toothpick to apply CA to the front part of the frame between the main board mounts - the roughened part as seen in the second picture.
- Attach the vertical front frame brace as shown. Tweezers help!

Step 3 — Install Frame Braces (continued 2)

- With the vertical frame brace installed, you may cut and remove the two uprights that surrounded the stock motor.
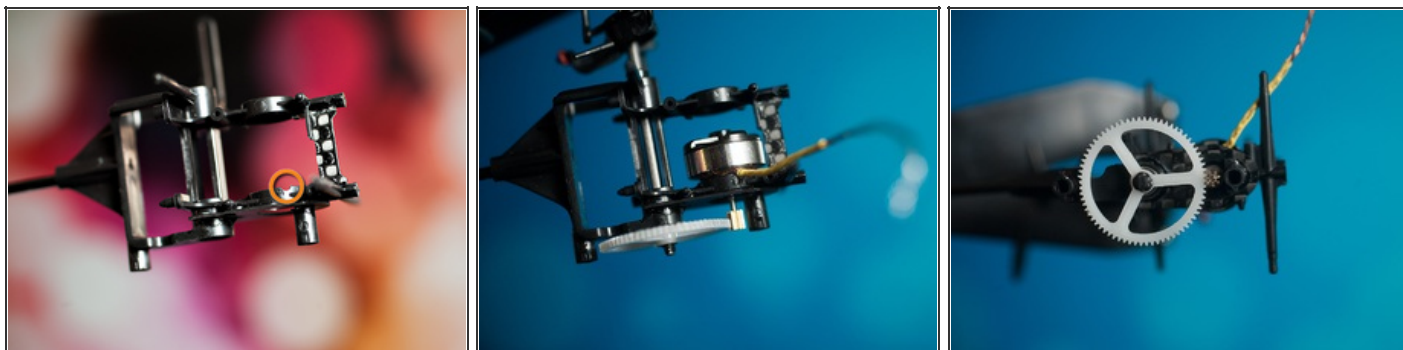- Next, cut a small notch for the motor clearance. See photo #2.

Step 4 — Install Frame Braces (continued 3)

- Next, reinsert the stock motor into the frame. The stock motor will help to align the lower CF brace into the proper position.

- Some minor fitting of the brace may be required to seat it just right. Then carefully CA glue the brace into place. *Again, I like applying CA using a toothpick for control.*

- *Take care not to accidentally glue the stock motor to the brace or frame.*

- Finish by installing the final CF brace into the upper stock motor mount hole. See photo #2.

Step 5 — Brushless Motor Installation

- Before installing the new brushless motor, we need to cut or file out a notch for the motor lead. See photo #1.

- Now, install the brushless motor, ensuring that the motor leads line up with the notch.

  - **Take care with the motor leads, especially where they enter the motor. The wires are fragile.**

  - *The latest brushless kit comes with the CNC-machined ABS adapter ring already preinstalled and motor windings secured.*

- Reinstall the main shaft and gear. Now, check and set the gear mesh to your liking. When using a new main gear, I like to set the mesh a little on the tight side on the tightest meshing part of the gears. You can file/trim the opening for the motor to set the mesh.

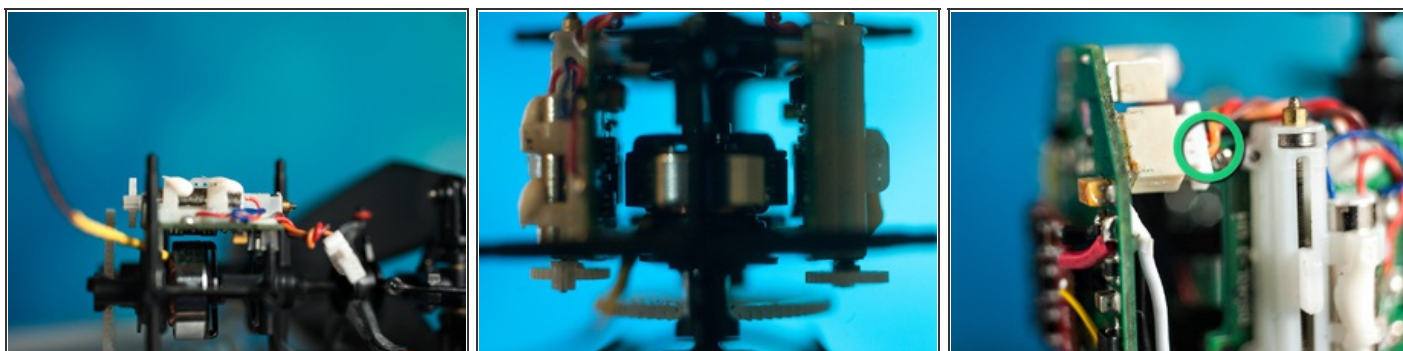 - Finally, secure the motor to the frame with a small amount of CA.

Step 6 — Reinstall Servos

- Find the spacer and associated screws from your brushless kit. The spacer will move the servos outward by a about 2.5mm so that they clear the brushless outrunner motor.

- Install the spacer with the longer screws included in the kit. I like to squish the spacer tubes once the screw has been inserted. This helps the spacers stay on the screws.

- *When installing on a brand new frame, it's best to insert a screw into the new holes to pre-thread them. It will make servo installation much easier.*

- You can apply a little bit of CA on the diagonal spacer tube that accepts no screw to help keep it on the frame.
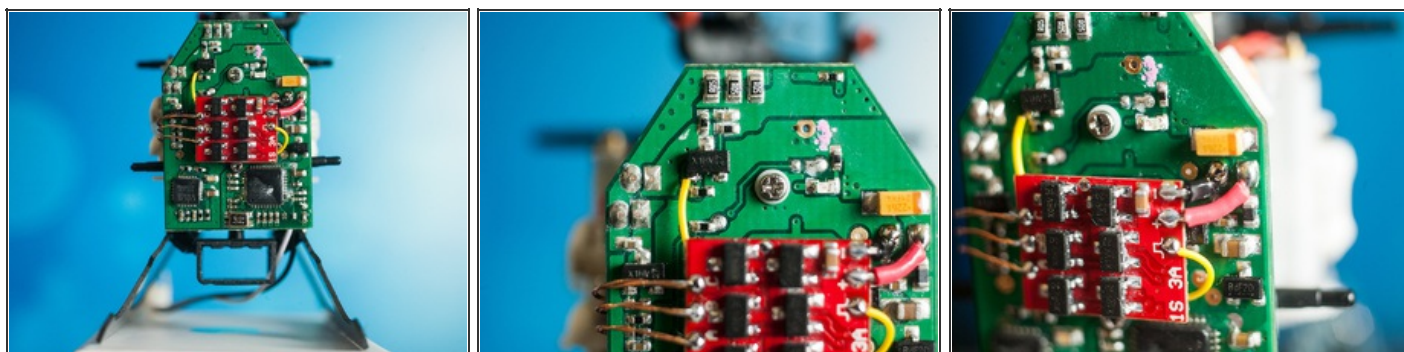
Step 7 — Check for Clearance

- Install both side servos and check for clearance. The brushless motor should not rub on any part of the servo board.

- The front left servo plug has very little clearance, so you should plug in that servo before completely tightening the two screws that secure the RX board onto the frame. See photo #3.

Step 8 — ESC Installation

- The Nano CP X brushless kit comes with a XP-3A ESC that has been pre-flashed with BLHeli and also pre-configured to receive a negative PWM signal input. This allows you to solder to the lower left leg main motor FET as shown in photo #2.

- 24 or 26 gauge wire is recommended between the ESC and RX. Make sure to double-check the polarity. It is clearly labeled on the XP-3A.

- It's best practice to solder the three motor wires directly to the ESC. The wires can initially be soldered to any point. When you power up, give throttle and check the rotation of the main blades. They should rotate clockwise. If the rotor spins the opposite way, simply swap any two motor wires to correct the rotation of your main blades.

- **You are now finished with the installation!** See the concluding remarks below for additional steps and info.

Congratulations. You finished the brushless upgrade. Some quick notes about transmitter configuration:

For the Mild kit, set your pitch travel adjust to L85 H85 and set your idle-up (stunt mode) throttle curves to a flat value between 68-75% as recommended by Dylan of Astroid Designs. From that reference point, you can adjust the throttle curve as well as pitch curves to your liking.

The brushless motor and ESC require an arming sequence after you insert the LiPo. Simply flip off throttle hold, move the throttle stick up, then back down. You will hear a series of musical tones to indicate arming is complete. Go to the HeliFreak brushless Nano subforum if you need more help with this concept.

Dylan compiled some BLHeli resources that can be found on this page.

Technical Summary:

The XP-3A ESC in the kit comes preflashed with BLheli. It is preconfigured to run a Main Governor TX mode and motor signal input polarity is Negative.

Main Governor P-Gain and Main Governor I-Gain are both set at x 2.00. Startup Power is set at x 1.25.

You can download the [setup ini file here](#) with the parameters flashed to the XP-3A.

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